



**US Army Corps
of Engineers**

Waterways Experiment
Station

RECNOTES

NATURAL
RESOURCES
RESEARCH
PROGRAM

VOL R-87-1

INFORMATION EXCHANGE BULLETIN

MAR 1987

Determining Resource Capability for River Recreation

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This article describes how a microcomputer program assisted a planning team in evaluating 27 sites for potential recreation development. The study was conducted over a 2-million-acre river basin within a two-month time frame. The use of a microcomputer reduced the time and labor that would have been necessary to organize and tabulate 23,000 separate calculations. In addition to providing a 108-page document containing site inventories, a floppy disk replaced the traditional paper-copy plan and provided a dynamic source of information that can be updated with relative ease.

Since a major task of resource management is to identify and compile information to improve daily decisionmaking, software programs that can categorize resource data in microseconds enhance effective management. The spreadsheet program used in this study functioned as a decision-support system where information could be entered and retrieved as needed. Changes in site conditions or objectives were accommodated by the floppy disk as the study progressed.

The microcomputer program used in this study allowed the planning team to address four resource planning aspects.

- Recreation opportunities that are unavailable in a smaller area can be provided by a large wildland area such as a river basin, yet this requires a regional perspective.
- A multiple-option framework utilizing a floppy disk increases alternatives available to managers.

- Decisionmaking improves when the basis for information gathering is clearly documented.
- The inventory procedures and spreadsheet program must be understood by field personnel with little familiarity in computer applications.

REGIONAL APPROACH

The Southwest Tributaries Basin located in Mississippi provided an opportunity to test the application of the microcomputer to resource management. The objective was to determine resource capability for recreation development along three major rivers. This was part of other reconnaissance studies inventorying wildlife and fisheries. Access to the rivers was considered the major factor in providing recreation opportunities since the region is predominately rural and forested.

Although the three streams are not popular for floating, they do attract activities that are enhanced by flowing water and natural sandbars. The basin-wide perspective allowed the team to consider *what* kind of activities could be developed based on site conditions and *where* they could best take place to provide a balance of opportunities within the region.

LAND USE PLANNING METHODS

Resource supply. In this study, resource supply information was gathered

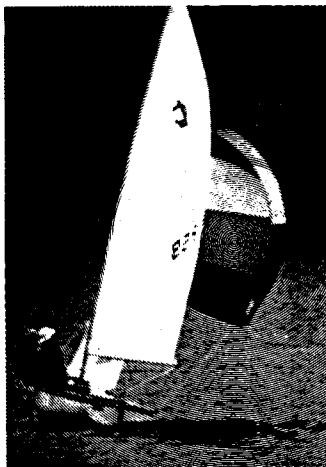




Figure 1. Assigning numbers to features

in the field with demand data obtained from secondary sources. The Rivers Method* was adapted as an analytical procedure to gather information for the purpose of comparing areas for land use. A four-page field evaluation form was modified to account for regional conditions found within southwestern Mississippi. The checklist contained 10 categories that included 44 resource features; (e.g., basic physical factors, special physical features, water quality, soils, biological factors, land use, aesthetics, accessibility, managerial control, and social interaction). Each feature was rated on a five-point scale (Figure 1). For example, the rating for the width of a stream ranged from one to five with each number referring to specific widths, such as a rating of 1 for widths of 10 to 20 ft. Assigning numbers to features forced the team to critically examine each attribute while in the field.

* Chubb, M., and Bauman, E. H. 1977. "Assessing the Recreation Potential of Rivers," *Journal of Soil and Water Conservation*, March-April.

Scores from the ten categories were totaled to result in one score for each site. Once this information was entered on the microcomputer, the site inventory process was complete and comparisons among sites could be made.

Resource demand. Resource settings can be compared for many purposes. For this project, the study manager wanted the team to "shake out areas for potential recreation development." Recreation planning has long viewed settings as places for activities to occur. A shortcoming of this approach is that a recreation experience is more than participating in an activity. Also, settings influence the kind of experiences users seek and the type of users attracted to a setting. When resource settings, recreation experiences, and activities are considered as parts of a whole picture, a new dimension is added to the way we develop areas for recreation.

The categories of wild, scenic, and social combine settings with experiences sought. *Wild* settings offer opportunities for solitude where the signs of man are minimal. *Scenic* settings are likely to offer opportunities for moderate contact where the settings are not heavily developed but with signs and minor access-type improvements. *Social* settings offer opportunities for greater contact with others under conditions where man-made development can be substantial, such as campgrounds and picnic areas.

Activities were grouped into one of the three categories (Figure 2).

FINDINGS

In addition to saving time and labor, this process taught the team three important lessons that could assist information management and resource planning at the project level: feedback, monitoring, and categorizing activities into experience levels.

<i>Wild</i>	<i>Scenic</i>	<i>Social</i>	Setting
Wilderness canoeing	General canoeing	Wading	+
Nature study	Small craft boating	Picnicking	Activity
Trail camping	Bank fishing	Vehicle camping	+
Hunting	Boat fishing	ORV riding	
		Tubing	
CONTACT WITH OTHERS			Experience
LOW	MODERATE	HIGH	

Figure 2. Example of assignment of activities to experience levels

Feedback. A decision-support system facilitated by a microcomputer permits the feedback that is essential to accommodate changes in priorities or the addition of new information. Once an inventory is completed, the study manager can examine the results of "where we are" and refine the objectives to determine "where we want to be" in terms of recreation opportunities provided.

Monitoring. This type of support system allows for monitoring of resource attributes at some later date. After suitability analysis is prepared, sites can be quickly reexamined using the same or improved procedures. For example, if a hunting club opened on or near the site, which happened during this study, adjustments can easily be made in the database. This allows a planning team more time to grapple with the meaning of new findings.

Categorizing. It is easier for the team to com-

municate with the study manager in terms of opportunity/experience levels (e.g., wild, scenic, and social) rather than with a long list of unrelated activities.

SUMMARY

Land use planning projects that follow a process where decision points are common would benefit greatly from the use of microcomputer capabilities along with accepted evaluation procedures. Possible uses include the planning and management of marinas, campgrounds, day-use locations, and other developments, etc. where large wildland areas are involved. This methodology can also be applied to comparison of alternatives in planning studies and environmental impact assessments.

The authors will provide the complete report on this study or other assistance on request.

Why Did They Drown?

*Scott A. Grenfell, Chief Ranger
Millwood Lake, Little Rock District*

Newspaper headlines seem to constantly proclaim the same sad message over and over:

LOCAL YOUTH DROWNS IN RIVER
TWO MEN DROWN ON FISHING TRIP
ROUGH WATER CLAIMS THREE LIVES
OUTING ENDS IN TRAGEDY - MAN,
WIFE, AND CHILD DROWN

Because such occurrences are so common, the reports of drownings are often looked at casually by readers and then forgotten. When you work at any water-based recreation facility, however, the reports cannot be regarded lightly, but they will yield valuable information if analyzed properly.

Since 1966 when the US Army Corps of Engineers completed the construction of Millwood Dam, fifty drownings have occurred at the reservoir.* Each tragedy may have had unique circumstances that contributed to the drowning or drownings, but computer analysis of all drownings showed surprising similarities in many instances.

* Although fifty drownings have occurred at the project, not all were considered in the subsequent analysis. Seven deaths attributed to drowning resulted from a midair collision of two light planes. Because the circumstances surrounding the accident were so extraordinary, the data from the incident were not used to avoid biasing all of the statistics.

METHOD OF ANALYSIS

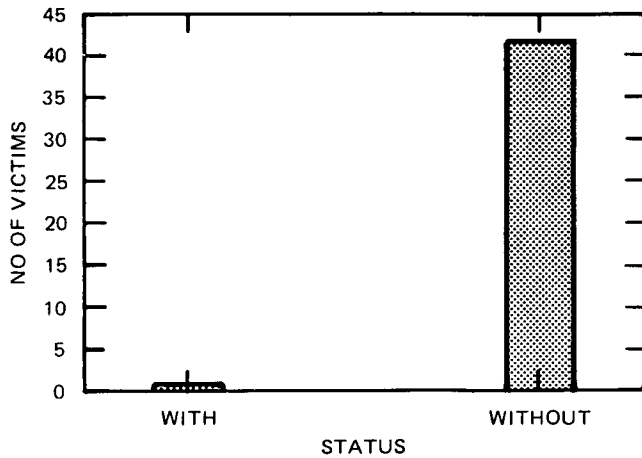
Official reports of each drowning were briefly summarized and entered into a computer. The data included the date of drowning, name and age of victim, location of drowning, circumstances contributing to the drowning, and probable cause of drowning. These data were entered into the appropriate software program and were used to develop a "drowning profile" for Millwood Lake. The analysis of the drowning profile has provided a framework for attacking the problem of the senseless loss of lives due to drowning.

The graphs shown on the following page (Figure 1) are examples of how computer analysis aided in developing a plan of action to reduce the drowning incidents at Millwood Lake. Following each graph is a brief description of the significance of the data.

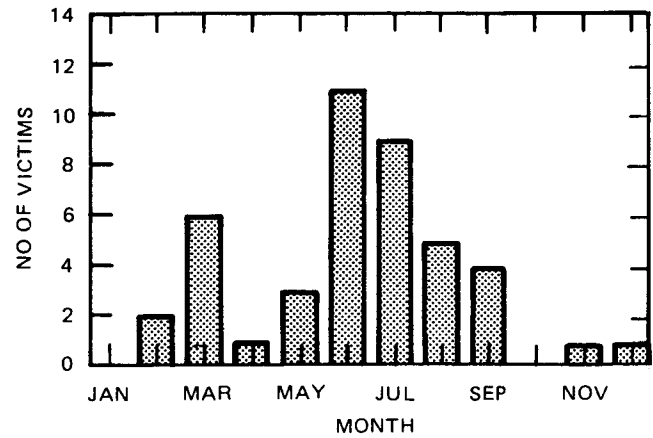
LOCAL DROWNING PROFILE

In addition to the characteristics shown in the graphs, analyses included the nature of the accident, sex of the victim, year, victim familiarity with the lake, and area of the lake where drowning occurred. All of this information was used to develop a local drowning profile that has provided the framework for a drowning prevention program at the project. The following is the drowning profile:

(Continued on page 5)



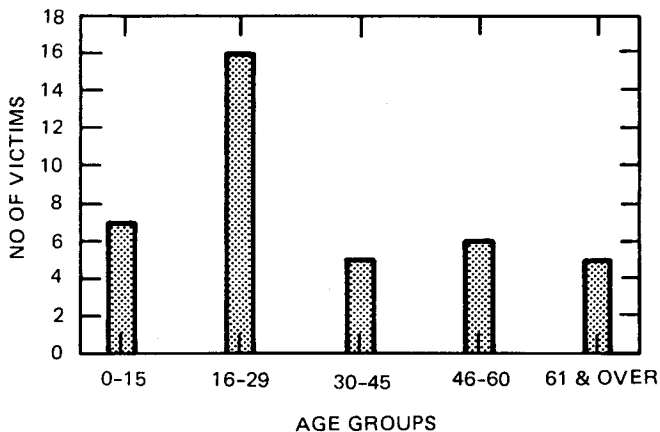
a. Drownings with and without life jackets.



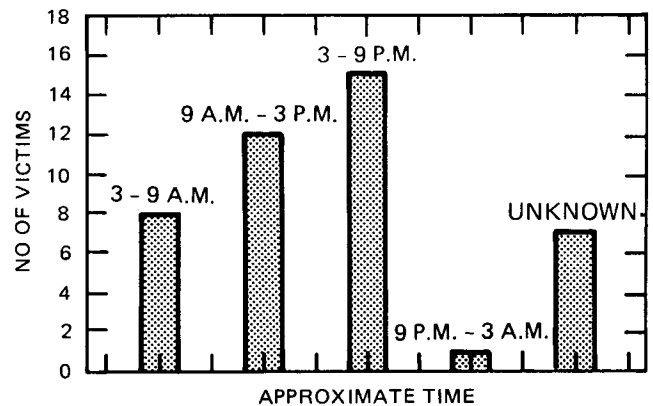
b. Drownings by month.

LIFE JACKETS — Almost 98% of the individuals who drowned were not wearing life jackets. Rangers hear common excuses such as the jackets are too hot or too uncomfortable or that boaters believe “it can’t happen to me.”

TIME OF YEAR — The greatest number of drownings at Millwood Lake have occurred in June and July. This is probably due to the fact that more people are involved in water-related activities during this time period.



c. Drownings by age groups.



d. Drownings by time of day.

AGE GROUP — More than twice as many individuals in the 16-29 age group have drowned than in any other category. This is probably due to the fact that individuals in this age group exhibit less caution in water-related activities, have less experience in dealing with boat safety and handling, and, as the young people admit during safe boating programs, there is a great deal of drinking by this age group.

TIME OF DAY — The majority of drownings occurred between 3 p.m. and 9 p.m. Reasons for this may be that individuals are tired from a day of water-related activities; they may be in a hurry to get off the lake because they have stayed longer than anticipated; or they have consumed more alcoholic beverages than their systems can handle. In any of these situations, individuals are less cautious and pay less attention to safety.

Figure 1. Examples of statistics used in establishing a local drowning profile.

The typical victim, a male (66%) 16 to 29 years of age who lived within a 25-mile radius of the lake (56%), was not wearing a life jacket (98%). The boating-related drowning (56%) occurred most frequently in June or July between 3 and 9 p.m.

DROWNING PREVENTION PROGRAM

Armed with the local drowning profile and making the assumption that potential drowning victims will most likely exhibit many of the same characteristics as past drowning victims, the following course of action has been implemented.

- Because statistics have shown that 56% of the drowning victims lived within a 25-mile radius of the lake, programs for local schools, civic groups, and businesses have been initiated. The use of the graphs as visual aids in the programs has been beneficial in quickly and effectively demonstrating why and how people are likely to become drowning victims at Millwood Lake. These programs focus heavily on the importance of wearing life jackets when on, in, or near the water.
- The information has been provided to local legislators to stress the problems and to discuss possible legislation, such as mandatory wearing of life jackets, that could lessen the risks associated with water-oriented activities.
- Information on the drowning profile has been given to various news media for publication or broadcast. This has included school newspapers, commercial newspapers, radio stations, and television stations. The use of the information by the news media has spread the water safety message beyond the local level.
- Ranger patrols now include a good portion of time to be spent at launch ramps and beaches talking to people about water safety. Over 1500 face-to-face contacts have been made at the launch ramps, and the reaction of the public has been tremendous. The water safety talks are brief but effective as the various graphs can be discussed in a short time and then handed to the visitors to show to their family and friends. In this way, the information is given to many individuals who may not have been exposed to the findings through programs or the news media.
- Increased boat patrols on the lake during high-incident drowning times are used to discuss water safety with the boaters. The rangers making these contacts stress the importance of wearing life jackets and also

discuss other pertinent information obtained in the computer analysis.

RESULTS

In the eight-month period following the initiation of the intense water safety campaign by Resource Management personnel at Millwood Lake, more than 18,000 face-to-face contacts have been made; 25 water safety news releases have been printed in 10 different newspapers; 151 daily water safety messages have been broadcast on radio stations; and 2 television programs devoted entirely to water safety have been broadcast. Most recently, the author participated in hearings of the Arkansas State Legislature subcommittee on boating laws regarding mandatory requirements for wearing life jackets in boats under power.

The most significant accomplishment of the water safety campaign has been that no drownings occurred during the time period, which included the critical months of June and July. In addition, an unofficial survey of boaters on the lake showed that over 70% of the individuals boating on the lake were wearing life jackets...a very positive statistic.

SUMMARY

Water-based recreation areas provide the setting for a multitude of recreation activities that are extremely popular with the public, but there are certain risks inherent in the enjoyment of the facility. The management of these risks, to the greatest extent possible, is the responsibility of the resource agency. Before a risk can be managed effectively, individuals in the management sphere must have a grasp of the problem that they are facing.

Computer analysis of drownings at a reservoir or other water-based facility with the intention of developing a drowning profile is a tremendous tool in getting a good idea as to what the problem is. Once the profile has been established, management decisions can be made on a local level on how to control or make the public aware of the problem to reduce the likelihood of future fatalities. Similar profiles can be developed for any water-based recreation setting to assist in establishing an effective water safety program.

One important point to keep in mind—the analysis only shows what happened in the past. Creative use of the information coupled with a definite plan of action must be the cornerstone in reducing the number of drownings at any water-based recreation area.

Computerized Recreation Surveys

by
Dorene A. Bollman, Outdoor Recreation Planner
Rock Island District



Hand-held computer used in recreation survey

In times of manpower restrictions, funding cutbacks, and other administrative constraints, it becomes clear that a manager must work smarter to stay ahead. This fact is certainly true when considering recreation survey data collection and processing.

Our experience shows that mistakes or omissions are easily made when using the survey coding sheets (ENG Form 4835). Surveyors often get confused regarding data required by the survey and code too much or too little data, omit necessary data altogether, or code data in the wrong column. In addition, keypunching delays are time consuming and inefficient.

In order to get more accurate load factors, a special edit program must often be used to identify and correct mistakes. Sometimes, additional time is needed to correct more isolated but important errors. In view of these problems,

there had to be a better way to collect and process survey data.

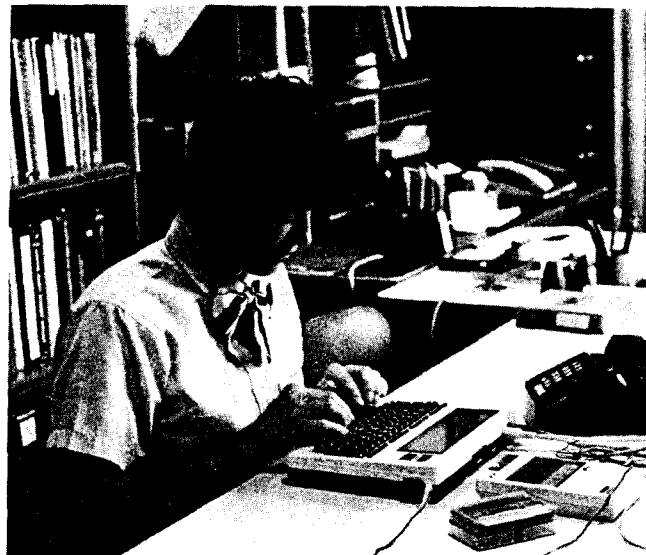
Hand-held computers were investigated as a way of replacing the coding sheets. The Radio Shack TRS-80 Model 100* suited the survey requirements. The computer can be easily programmed, runs on batteries, is lightweight and cheap, and can be used to transmit stored survey data over phone lines.

The major advantage with computerized data collection is that this method forces survey questions to be answered correctly. For example, the surveyor responds to the computer prompts with numeric or "yes" "no" answers. The computer codes the responses according to the ENG Form 4835 format. Then the program screens the coded responses for inaccuracies or omissions. If five people are reported to be in a vehicle, then there must be at least five participants in both project and area activities. If a visitor is not an area camper, then the surveyor must respond to the day/hours question. Also, the computer skips questions and prefills responses based on previous answers. If a mis-

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Over-the-shoulder view of computer



Data being transferred to cassette tape

take is made, the computer catches the error and forces the surveyor to correct it. Even an inexperienced surveyor can very quickly enter survey data correctly.

Once the entire survey session has concluded, the surveyor records the data from the hand-held computer to a cassette tape. Taped data are sent via phone lines to the district's mainframe computer where files are set up to hold the survey data. Loading factors are calculated by the mainframe computer.

Since the district began using the computerized survey method, the processing time has been substantially reduced, and the accuracy and

reliability of the load factors have improved. The biggest drawback is the extra time needed by the district office staff to load the survey tapes. However, the total time needed to process a computerized survey is much less than the time needed to process a survey taken under the previous method.

The computerized method of recreation surveying is an example of working smarter — not necessarily harder. If you have questions about this improved approach to recreation surveying, please call Dorie Bollman, extension 483, or Mike O'Keefe, extension 271, at the Rock Island District Office, 309/788-6361.



NATURAL RESOURCES RESEARCH PROGRAM

This bulletin is published in accordance with AR 310-2. It has been prepared and distributed as one of the information dissemination functions of the Environmental Laboratory of the Waterways Experiment Station. It is primarily intended to be a forum whereby information pertaining to and resulting from the Corps of Engineers' nationwide Natural Resources Research Program can be rapidly and widely disseminated to OCE and Division, District, and project offices as well as to other Federal agencies concerned with outdoor recreation. Local reproduction is authorized to satisfy additional requirements. Contributions of notes, news, reviews, or any other types of information are solicited from all sources and will be considered for publication as long as they are relevant to the theme of the Natural Resources Research Program, i.e., to improve the effectiveness and efficiency of the Corps in managing the natural resources while providing recreation opportunities at its water resources development projects. This bulletin will be issued on an irregular basis as dictated by the quantity and importance of information to be disseminated. Communications are welcomed and should be addressed to the Environmental Laboratory, ATTN: A. J. Anderson, U.S. Army Engineer Waterways Experiment Station, P.O. Box 631, Vicksburg, MS 39180-0631, or call AC 601, 634-3657 (FTS 542-3657).

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NATIONAL TAKE PRIDE IN AMERICA AWARDS ★ ★ ★

The National Take Pride in America (TPA) Awards Program offers an excellent chance to reward Corps efforts as well as outside individuals, organizations and corporations. If you haven't taken a look at the award program booklet, get a copy and see what it offers you!

Five winners were recently selected by our panel of judges to represent the Corps in the national TPA competition. Assistant Secretary of the Army (Civil Works) Robert Dawson personally transmitted the following to the TPA staff as our nominees for national honors.

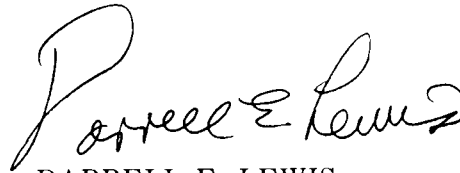
Joan "Jo Jo" Cyr, Park Ranger
New England Division

Crooked Creek Lake Project
Pittsburgh District, **OHIO RIVER DIVISION**

The Great Altoona Cleanup
Mobile District, South Atlantic Division

WAPAMA Historic Ship Restoration
San Francisco District, South Pacific Division

The National Campers and Hikers Association Cleanup and Camporee
New England Division



DARRELL E. LEWIS
Chief, Natural Resources Management
Branch, (DAEN-CWO-R)

CORRECTION — CORRECTION — CORRECTION

RECNOTES, vol. R-86-3, article entitled "Camping Passes Provided Customer Care": The area code in the phone number for Ms. Bollman should have been **309**. Our apologies to Dorene and the RECNOTES readers who may have been inconvenienced by this mistake.